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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appl. No. : 09/830,507
Applicant (s) : Chou, et al.
Filed : June 15, 2001
TC/A.U. : 1714
Examiner : Yoon
Title : NANOCOMPOSITE
Docket No. : 44407
Customer No. : 00109

Confirmation No. 8190

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Beth L. Ramon

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Beth L. Ramon

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10/6/03

DATE OF SIGNATURE

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Sir:

BRIEF FOR APPELLANT - FEE SHEET

This is an appeal to the Board of Appeals from the action of the Primary
Examiner finally rejecting Claims 1-19, in the above-identified patent application.

Please charge the \$330.00 fee to our Deposit Account No. 04-1512. If this
amount is incorrect, please charge or credit our account accordingly. One original and
two duplicate copies of this sheet are enclosed.

Respectfully submitted,

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

BRIEF FOR APPELLANT

This is an appeal to the Board of Patent Appeals and Interferences from
the Final Rejection of the Examiner rejecting Claims 1-19.

Three copies of the Brief are supplied herewith for the Honorable
Board of Appeals. In accordance with 37 CFR §1.194(b), Appellants defer request for
oral hearing until one month after the date of the Examiner's answer.

Real Party in Interest

The Real Party in Interest in this Appeal is The Dow Chemical
Company.

At this time there are no related appeals or interferences.

Status of Claims

Claims 1-19 are on appeal, having been finally rejected in a communication mailed on May 12, 2003. A copy of the claims on appeal is attached as an appendix to this appeal (Appendix A).

Status of Amendments

The status of Amendments is unknown. On August 5, 2003, Appellants filed a Notice of Appeal and a Reply to the June 30, 2003 Advisory Action. The Reply to the Advisory Action includes Amendments to the claims and specification. The undersigned called Examiner Tae Yoon on September 30, 2003 to inquire about the status of the Amendments and was told that he has not received the Reply to the Advisory Action. Examiner Yoon called the undersigned on October 3, 2003 informing her that he has not received the Notice of Appeal and the Reply to the Advisory Action and advised the undersigned to file an Appeal Brief by the due date of October 5, 2003, to keep the Appeal from being dismissed.

Summary of Invention

Referring to the specification, on page 1, lines 18 to 26, Appellants' invention is a process for producing a nanocomposite polymer by dispersing a multi-layered silicate material into a thermoplastic polymer comprising the step of: mixing a quaternary ammonium intercalated multi-layered silicate material with the thermoplastic polymer at a temperature greater than the melting or softening point of the thermoplastic polymer, characterized by the quaternary ammonium intercalated multi-layered silicate material having been reacted with a polyvalent anionic organic material to form a polyvalent anionic organic edge coated quaternary ammonium intercalated multi-layered silicate material.

Referring to the specification, on page 1, lines 26-35, Appellants' invention is a process for producing a nanocomposite polymer by dispersing a multi-layered silicate material into a thermoset polymer comprising the steps of (a) mixing a

quatarnary ammonium intercalated multi-layered silicate material with a thermoset prepolymer, characterized by the quatarnary ammonium intercalated multi-layered silicate material having been reacted with a polyvalent anionic organic material to form a polyvalent anionic organic edge coated quatarnary ammonium intercalated multi-layered silicate material and (b) curing the thermoset prepolymer to set the thermoset polymer.

Referring to the specification, on page 1a, lines 1-4, Appellants' invention is a composition comprising: (a) a polymer; and (b) a multi-layered silicate material dispersed in the polymer, the multi-layered silicate material having edges, characterized by at least a portion of the edges of the multi-layered silicate material being bound to a polyvalent anionic organic material.

Referring to the specification on page 1a, last line, to page 2, lines 1-6, Appellants' invention is a process for producing a nanocomposite polymer, comprising the steps of: (a) mixing a quatarnary ammonium intercalated multi-layered silicate material with a monomer, characterized by the quatarnary ammonium intercalated multi-layered silicate material having been reacted with a polyvalent anionic organic material so that the edges of the multi-layered silicate material are bound to the polyvalent anionic organic material to form a polyvalent anionic edge coated quatarnary ammonium intercalated multi-layered silicate material; and (b) polymerizing the monomer.

Issues

(1) Whether Claims 3, 4, 7, 8 and 14, under 35 USC 112, first paragraph, contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

(2) Whether Claims 1-15 are unpatentable under 35 USC 103(a) over WO 93/04117 or Christiani et al (US 5,747,560) in view of Suss et al. (US 4,558,075).

(3) Whether Claims 16-19 are unpatentable under 35 USC 103(a) over Kawasumi et al. (US 4,810,734) or Polansky et al. ((US 6,287,992) in view of Suss et al. (US 4,558,075).

Grouping of Claims

For the purposes of this appeal, the Board may consider all pending claims in one group that stands or falls together.

Argument

(1) Claims 3, 4, 7, 8 and 14, under 35 USC 112, first paragraph, do not contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention because Transmission electron microscopy (TEM) is a well known microscopy technique at least twenty five years before the subject patent application was filed as shown by the fact that TEM is mentioned in at least 2500 U.S. patents granted before the filing date of the subject patent application. A partial listing of the U.S. patents granted from February 17, 1976 up to May 15, 2001 is enclosed as Appendix B. Thus, Applicants submit that Claims 3, 4, 7, 8 and 14 do not contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention and, therefore, are in compliance with the requirements of 35 U.S.C. 112, first paragraph.

*The test for obviousness is whether the claimed invention, as a whole, in light of all of the teachings of the references in their entireties, would have been obvious to a person of ordinary skill in the art at the time that the invention was made. Id. at 199. Obviousness cannot be established by combining the teachings of prior art to produce the claimed invention, **absent some teaching, suggestion or incentive supporting the combination.** ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Absent such a showing in the prior art, the Examiner has impermissibly used the Applicants' teaching to hunt through the prior art for the claimed elements and combine them as claimed. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991); In re Bond, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990); In re Laskowski, 871 F.2d 115, 117, 10 U.S.P.Q. 2d 1397, 1398 (Fed. Cir. 1989).*

(2) Christianni et al. (US 5,747,560) do not teach or suggest a quaternary ammonium intercalated multi-layered silicate material having been reacted with a polyvalent anionic organic material so that the edges of the multi-layered silicate material are bound to the polyvalent anionic organic material to form a polyvalent anionic organic edge coated quaternary ammonium intercalated multi-layered silicate material, as required in Claims 1-15.

Suss et al. (US 4,558,075) disclose a solvent-based organic high solids coating composition containing (A) a film-forming binder system containing a cross-linkable resin and (B) an organo-modified clay dispersed in the coating composition; (C) a solvent and (D) organic polymeric particles.

The organo-modified clay is formed from the reaction of an organic cation, organic anion and smectite-type clay (col. 7, lines 33-36; col. 8, lines 10-11). The organic anion is capable of reacting with the organic cation and form intercalations with a smectite-type clay as an organic cation-organic anion complex (col. 9, lines 53-55).

Suss does not teach polyvalent anionic organic material. Suss does not teach reacting a multilayered silicate material with an organic cation, such as a quaternary ammonium salt, to form a quaternary ammonium intercalated multi-layered silicate material and then reacting the quaternary ammonium intercalated multi-layered silicate material with a polyvalent anionic organic material so that the edges of the multi-layered silicate material are bound to the polyvalent anionic organic material to form a polyvalent anionic organic edge coated quaternary ammonium intercalated multi-layered silicate material. Instead, Suss teaches reacting an organic anion with an organic cation and forming intercalations with a smectite-type clay as an organic cation-organic anion complex (col. 9, lines 53-55). Combining the teachings of Christiani et al and Suss et al. would not produce a polyvalent anionic organic edge-coated quaternary ammonium intercalated multi-layered silicate material, as required in Claims 1-15. The edges of the multilayered material would not be bound to a polyvalent anionic organic material as required in Claims 1-15 because neither Suss nor Christianni teaches a polyvalent anionic organic material, and since Suss teaches an organic cation-organic anion complex, the edges

of the multilayered material would not be bound to a polyvalent anionic organic material, as required in the claims.

As in Suss et al., WO 93/04117 does not disclose the preparation of nanocomposites from an anionic polymer edge-coated quaternary intercalated multilayered silicate material.

In view of the above remarks, Appellants submit that Claims 1-15 are patentable under 35 U.S.C. 103(a) over WO 93/04117 or Christianni et al (US 5,747,560) in view of Suss et al. (US 4,558,075).

(3) Neither Kawasumi nor Polansky teaches or suggests a quaternary ammonium intercalated multi-layered silicate material having been reacted with a polyvalent anionic organic material so that the edges of the multi-layered silicate material are bound to the polyvalent anionic organic material to form a polyvalent anionic organic edge coated quaternary ammonium intercalated multi-layered silicate material, as required in Claims 16-19.

Suss et al. have been discussed above.

In view of the above, Appellants submit that Claims 16-19 are patentable over US 4,810,734 or US 6,287,992 in view of US 4,558,075.

Conclusion

In view of the above remarks, Appellants respectfully request that the Final Rejection of Claims 1 to 19 by the Examiner be reversed and that a Notice of Allowance as to these claims be issued.

Respectfully submitted,

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